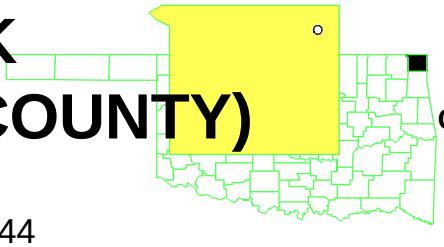
TAR CREEK (OTTAWA COUNTY)

OKLAHOMA

EPA ID# OKD980629844



EPA REGION 6
CONGRESSIONAL DISTRICT 02
Ottawa County
Updated: 06/19/97

Site Description

Location:
- Oklahoma portion of Tri-state mining district which includes northeastern Oklahoma, southeastern Kansas, and southwestern Missouri.
- Old Picher Field lead and zinc mining area, consisting of northern Ottawa County, Oklahoma, and southern Cherokee County, Kansas.

Population:
- Approximately 30,000 in area.

Setting:
- The site encompasses the towns of Miami, Picher, Cardin, Quapaw and Commerce, Oklahoma. Approximately one-half of the land in the mining area is Indian owned.

Hydrology:
- Contamination was in the Boone formation with great potential for lateral migration through an extensive series of mine workings.
- Roubidoux formation is the drinking water aquifer under Cotter and Jefferson City formations at about 1100 feet below surface.

Wastes and Volumes

Principal Pollutants in Water:

Contaminant	Level
pH	3.6-5.7
Lead	80 ug/L
Zinc	331,000 ug/L
Cadmium	80 ug/L

(ug/L = micrograms per liter)

Volume:
- Approximately 76,000 acre-feet of contaminated water.

Principal Pollutants in "Chat" (mine tailings):

Lead	750 mg/kg
Cadmium	46 mg/kg
Zinc	8,300 mg/kg

(mg/kg = miligrams per kilogram)

Volume:
Approximately 48 million cubic yards

Principal Pollutants in Settling Ponds (mine tailings)

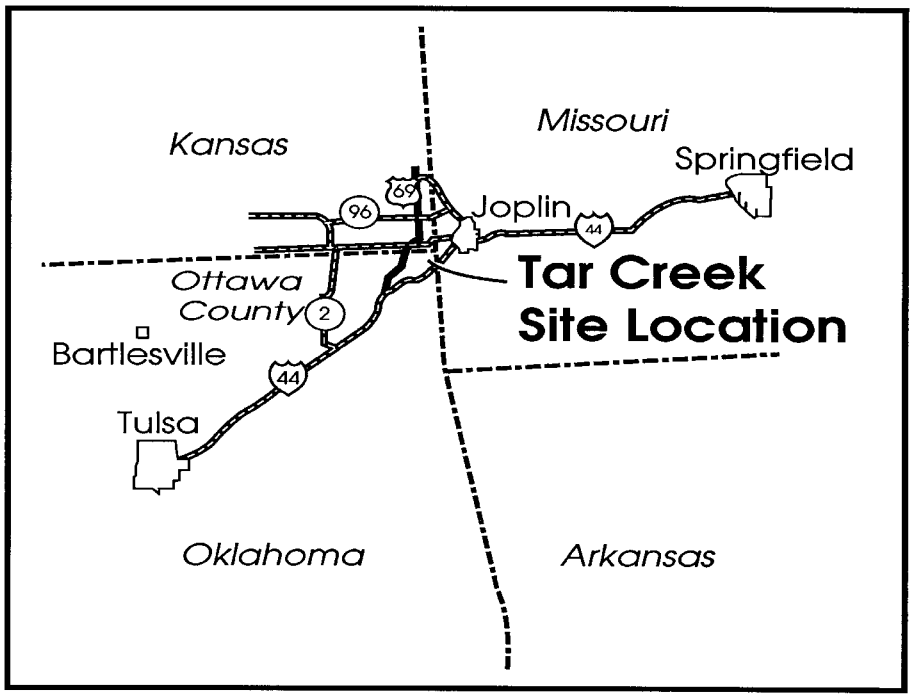
Lead	3,800 mg/kg
Cadmium	124 mg/kg
Zinc	21,600 mg/kg

Area:
Approximately 800 acres

Site Assessment and Ranking

NPL LISTING HISTORY
Site HRS Score: 58.15
Proposed Date: 7/27/81
Final Date: 9/08/83
NPL Update: No. 1

Site Map and Diagram



The Remediation Process

Site History:

- Major lead/zinc mining area from early 1900s-1960s.

- A few small operators continued mining until early 1970s.
- When the major mining ceased in the 1960s, the dewatering activities also ceased and the mines began filling with ground water.
- Highly acidic mine water containing high concentration of heavy metals began discharging into Tar Creek in 1979 from natural springs, bore holes, and abandoned mine shafts.
- A remedial investigation was conducted in 1982 and 1983 resulting in a Record of Decision (ROD) in June 1984.
- Roubidoux aquifer monitoring report completed 12/93.
- August - October 1985, an emergency water supply for the City of Picher was put in place by the National Guard. EPA plugged the contaminated well, drilled a new well and flushed city lines. Water quality returned to normal; National Guard discontinued water delivery.
- December 1986, construction of the ROD remedy was completed.
- April 1994, a Five Year Review of the remedy was issued. New studies to evaluate mining waste, not addressed in the original remedy, as a source of contamination began in Fall 1994.
- Iron levels in drinking water from 5 community wells in the mining area are elevated above secondary standards. The Oklahoma Department of Environmental Quality (ODEQ) is investigating to determine if the Roubidoux Aquifer is the source of the contamination.
- A summary of results of Indian Health Service testing made available to EPA in 1994 indicated that approximately 35% of the Indian children tested in the area had blood lead levels greater than 10 ug/dL, the level that is considered elevated.
- EPA investigated 28 high access areas (day cares, schools, parks, and similar areas where children tend to congregate) in Fall 1994 for mining waste contamination.
- Ten of the 28 high access areas (HAA) were targeted for removal actions.
- The Oklahoma Department of Health completed the screening of children in the mining area for blood lead poisoning in October 1995. In the Picher-Cardin area, the heart of the mining area, 21 percent of the children had elevated blood lead levels.
- Remedial investigation and feasibility study (RI/FS) work plans for the mining waste were completed by the Army Corps of Engineers in July 1995.
- EPA completed sampling soil at approximately 2,000 residences in the mining area for lead and cadmium contamination in August 1995.
- The PRPs were issued Special Notice for the residential RI/FS and remedial design (RD) in November 1995, but they declined to conduct or finance the work.
- The Corps of Engineers awarded a delivery order on April 17, 1996, to its contractor to perform the residential area RI/FS.
- The Corps of Engineers awarded a delivery order on May 1, 1996, to its contractor to perform the removal action which will be completed Summer 1997.
- EPA has completed the RI/FS for the residential areas and has issued the following reports: Data Evaluation Sumary Report, August, 1997; Baseline Human Health Risk Assessment of Residential Exposures, August 1996; Preliminary Remediation Goals, Residential Exposures, September, 1996; Residential Remedial Investigation Report, January, 1997; and Residential Feasibility Study Report, February, 1997.

Health Considerations:

- The lower aquifer serves several towns and rural communities in Ottawa County and is threatened due to several bore holes and leaking abandoned wells connecting the aquifer. Eighty-three of these bore holes were plugged in 1986 to prevent migration to the Roubidoux.
- Current public water supply monitoring indicates that primary drinking water standards are not being exceeded in the Tar Creek area.

Other Environmental Risks:

- High concentrations of heavy metals have been discharged to the surface water. The shallow Boone Formation aquifer has been contaminated with heavy metals.
- Lead contamination in surface soils is a source of exposure to children living in the area.

Record of Decision

Signed: June 6, 1984

- Remedy signed as complete 12/86.
- The remedy included diversion and diking of two major inflow areas in Kansas and one potential inflow area in Oklahoma.
- Plugging 83 identified abandoned wells in the Roubidoux aquifer, and any other abandoned wells found connecting the Roubidoux.
- Monitoring plan to monitor contamination of the Roubidoux aquifer and Tar Creek.

Other Remedies Considered	Rationale for Dismissal
1. Collection and treatment of mine water	**Very expensive ($30M) and probably ineffective.**
2. In Situ treatment of mine water	**Very expense ($30M) plus technical infeasibility.**
3. Surface discharge treatment	**Would only capture a portion of the discharge at excessive expense.**
4. Alternative drinking water	**More expensive ($6M)**
5. No action	**Environmentally unacceptable.**

Community Involvement

- The Oklahoma Department of Environmental Quality (ODEQ) has the lead on community outreach.
- Open Houses and Workshops: 12/86, 4/94, 8/94, 1/95, 5/95, 9/95, 1/96, 6/96, 2/97
- Public Meetings: 2/9/84 and 3/27/97
- Proposed Plans: 2/84 and 3/97
- ROD Press Release (EPA): 6/84
- Milestone Fact Sheets/Press Releases: 6/82, 12/82, 1/84, 7/84, 10/84, 11/85, 12/86, 3/94, 5/95, 9/95, 6/96, 2/97
- Citizens on site mailing list: 7

- Site Repository: Miami Public Library, 200 North Main Street, Miami, OK 74354

Technical Assistance Grant

- Availability Notice: None
- Letters of Intent Received: None
- Grant Award: None

Fiscal and Program Management

- **Remedial Project Manager (EPA):** Noel Bennett, P.E., 214/665-8514, Mail Sta. 6SF-AP
- **State Contact:** Monty Elder (ODEQ)
- **Community Involvement Coord. (EPA):** Donn Walters, 214/665-6483, Mail Sta. 6SF-P
- **Attorney (EPA):** Jim Costello, 214/665-8045, Mail Sta. 6SF-DL
- **State Coordinator (EPA):** Roberta Hirt, 214/665-8079, Mail Sta. 6SF-AP
- **Prime Contractor:** After Action Monitoring (Oklahoma Department of Environmental Quality)
  Removal Activities (EPA Technical Assistance Team)
  Mining Waste RI/FS (Army Corps of Engineers)

Cost Recovery:

- PRPs Identified: 148
- Viable PRPs: Six former mining companies are viable PRPs.
- Cost recovery after completion of RD/RA.
- Consent Decree entered June 10, 1991 - United States District Court Northern District of Oklahoma
- EPA settled with the Potentially Responsible Parties.
- Amount recovered pursuant to Consent Decree: $1,273,000.00, check dated June 19, 1991.
- Payment reimbursed Government for cost incurred in connection with the RI/FS, the ROD, and Emergency Response involving the Picher Municipal Well.
- The 6 defendants and signatories to the Decree were 1) ASARCO, Inc.; 2) Blue Tee Corporation; 3) Childress Royalty Company; 4) Gold Fields Mining Corp.; 5) NL Industries, Inc.; and 6) St. Joe Minerals Corporation.

Present Status and Issues

- A Phase II Ground Water Monitoring project is being conducted by ODEQ. The purpose of the monitoring is to determine the source of contamination in the 5 community wells that do not meet secondary drinking water standards.
- A report of studies to evaluate blood-lead levels in area children will be completed in Spring 1997. Studies are being conducted by the Oklahoma State Department of Health and local health departments.
- Approximately 50 per cent of the land in the Oklahoma portion of the mining district is owned by the Quapaw tribe. Remedial actions on these lands are not subject to the cost share provisions of Superfund.
- In addition to the parties (companies that formerly mined at the Site) that settled with EPA in 1991, the U.S. Department of the Interior may be a responsible party at Tar Creek. Discussion with mining companies are ongoing.
- An Action Memorandum to address the HAAs was signed on August 15, 1995. The soil removal work began September 15, 1995 and is scheduled for completion in Summer 1997.
- The HAA removal consists of the excavation and disposal of soil from HAAs contaminated with lead and cadmium. The disposal area is located on-site in a mill tailings pond. The removal action/cleanup levels are 500 parts per million (ppm) lead and 100 ppm cadmium.
- An Action Memorandum to address high concentration soils in residential yards was signed on March 21, 1996. The trigger level that targets yards for cleanup is 1500 ppm lead and the cleanup level is 500 ppm lead. Also yards of children with elevated blood lead levels will be cleaned up if the soil lead levels are equal or greater than 500 ppm.
- The Corps of Engineers began residential soil removal work on June 24, 1996.
- Through April 1997, approximately 165 residential yards have been cleaned up.
- The contract for the Phase II Ground Water Monitoring contract was awarded on July 12, 1996. Field

work began August 1996 and is scheduled for completion Summer 1997.
- A proposed plan to address approximately 1,300 residential properties, in addition to the 300 residences being addressed by the removal action, was issued on March 17, 1997.
- EPA's proposal for the residential areas consists of excavation and replacement of lead contaminated surface soil.
- A ROD for the residential areas is scheduled for Summer 1997.

Benefits

- Actions by the State of Oklahoma and the EPA have reduced the potential for contaminants in the shallow ground water to migrate to deeper drinking water aquifers and have achieved the ground water cleanup standards established for the site.
- The State also has completed cleanup activities at the Tar Creek (Ottawa County) site for surface water improvement.
- Several miles of stream diversion reduces inflow to mines.
- Cleaning up the contaminated residential soil is expected to significantly reduce exposure of the population in the local communties to lead.